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I. REAL PARTY IN INTEREST

The real party in interest is Cisco Technology, Inc., a California corporation having a place of business at 170 W. Tasman Dr., San Jose, CA 95134.

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-3, 5-8, 14-16, 18-22 and 24-26 are currently pending, have been finally rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

There are no currently pending amendments.

V. SUMMARY

A. Summary of the Invention

The present invention concerns a scheme for merging information from two or more partially filled ATM cells into a single ATM cell. For example, first and second partially filled ATM cells may be removed from a cell stream and their payload information combined into a third (or "merged") ATM cell. Unlike prior schemes of this type, the present apparatus and methods allow for including information indicative of the merging method used to create the merged cell to be included therein.

ATM or Asynchronous Transfer Mode is a switching technology that provides for communication over digital networks. Unlike the variable length packets used by frame relay and other services, ATM service is based on switching fixed length packets of data known as cells. Cell switching, as ATM is also called, is gaining popularity for a variety of reasons. First, switch architectures can be

optimized to switch cells at much higher speeds than variable length packets. Second, multiple services requiring a variety of quality of service guarantees can be provided simultaneously.

Although the use of fixed length cells in ATM can be efficient in terms of allowing standardized switching apparatus to be used, for many applications (e.g., the transport of compressed voice as in telephony applications) the standard 53-byte cell provides too large a package for the data requiring transport through the network. As a result, much of the cell payload is merely "padding" and the transport of such padding wastes the available bandwidth of the ATM network.

Although several approaches to solve this problem may be available (e.g., the use shorter or variable length cells) it appears that a scheme wherein multiple payloads from other, partially filled cells are packed into one cell at a source and then later pulled apart at a destination offers particular promise. As noted in the present application, the ATM Forum has begun discussions regarding such bundling of data channels within a single cell. Further, one reference cited by the Examiner during prosecution of this application (Takashima, U.S. Patent 5,509,007) proposes such a scheme wherein the "merged" cell is made up of a number of fixed length portions to accommodate information from two or more partially filled cells. However, none of these schemes allow for including information regarding the merging method used to create the merged cell to be included in the merged cell itself.

Claim 1 is presented below with elements read on Figure 2 of the drawings as required in MPEP 1206.

1. A method for merging partially filled ATM cells, comprising the steps of:
 - removing a first partially filled ATM cell (30) from an ATM cell stream (34);
 - removing a second partially filled ATM cell (32) from the ATM cell stream (34);
 - and
 - merging the first partially filled ATM cell (30) and the second partially filled ATM cell (32) into a third ATM cell (38) having a header (40) that includes information indicative of the merging method used

As stated in MPEP 1206, the claims are not to be limited to this embodiment by such reading.

B. Summary of Rejections

Claims 1-3, 5-8, 14-16, 18-22 and 24-26 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a

way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Claims 1-3, 5-8, 14-16, 18-20, 24 and 25 were further rejected under 35 U.S.C. § 102(a) as being anticipated by Takashima et al., U.S. Patent No. 5,509,007 (“Takashima”).

Claims 21, 22 and 26 were further rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

C. Summary of the Reference

Takashima describes the merging of two or more ATM cells into a new ATM cell (e.g., at Fig 15 and the accompanying description) with header information to indicate the number of merged cells or the data boundaries of those cells. See, e.g., Takashima at col. 10, ll. 21-31.

VI. ISSUES

1. Whether claims 1-3, 5-8, 14-16, 18-22 and 24-26 contain subject matter which is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention, and are therefore patentable under 35 U.S.C. § 112, paragraph one.

2. Whether claims 1-3, 5-8, 14-16, 18-20, 24 and 25 are patentable over Takashima.

3. Whether claims 21, 22 and 26 are directed to statutory subject matter and are therefore patentable under 35 U.S.C § 101.

VII. GROUPING OF CLAIMS

For the purposes of this appeal, with regard to the ground for rejection stated in issue (1) claims 1-3, 5-8, 14-16, 18-22 and 24-26 stand or fall together but are separately patentable from the remaining claims. With regard to the ground for rejection stated in issue (2), claims 1-3, 5-8, 14-16, 18-20, 24 and 25 stand or fall together but are separately patentable from the remaining claims because it is undisputed that Takashima fails to anticipate any teaching or suggestion of

including information indicative of a merging method used in the header of the new ATM cell as presently claimed. Finally, claims 21,22, and 26 stand or fall together but are separately patentable from the remaining claims with respect to the ground for rejection stated in issue (3).

VIII. ARGUMENT

A. Claims 1-3, 5-8, 14-16, 18-22 and 24-26 Only Contain Subject Matter Which is Described in The Specification in Such a Way as to Reasonably Convey to One of Ordinary Skill in the Art That The Inventors Were in Possession of The Invention at The Time The Application Was Filed

The objections to the specification under 35 U.S.C. §112, first paragraph, are respectfully traversed. As explained in the Manual of Patent Examining Procedures (hereinafter MPEP), “a written description requirement issue generally involves the question of whether the subject matter of a claim is supported by [conforms to] the disclosure of an application as filed.” See MPEP § 2163.01. “The subject matter of the claim need not be described literally (i.e., using the same terms or in *haec verba*) in order for the disclosure to satisfy the description requirement.” MPEP § 2163.02. Only where “a claim is amended to include subject matter, limitations, or terminology not present in the application as filed, involving a departure from, addition to, or deletion from the disclosure of the application as filed, [should] the examiner … conclude that the claimed subject matter is not described in that application.” Id. However, in the present case the claimed feature of a cell including information indicative of a merging method used is more than adequately disclosed in the present application at pages 8 and 9.

Several examples of possible merging methods are described at page 8 of the specification. In one merging method example, fixed positions for n, 48/n-byte sub-cells are reserved. See specification at p. 8, ll. 11-16. In another example, a more elaborate indexing scheme for multiple sub-cells of different lengths is described. See specification at p. 8, ll. 17-18. Further examples described include merging methods with variations where an HEC byte is used or not; a limited VPI/VCI field is used or not; or an error control byte is used or not. See specification at p. 8, ll. 21-25. Thus multiple different methods may

be used and the VCI of the merged cell could be used to represent (or indicate) the merging method. See specification at p. 8, l. 26 - p.9 l. 1.

Additionally, if the examiner finds that the aforementioned portions of the specification do not fulfill the written description requirement, the examiner has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the applicant's disclosure a description of the invention defined by the claims. See In re Wertheim, 541 F.2d 257, 265, 191 USPQ 90, 98 (CCPA 1976). See also Ex parte Sorenson, 3 USPQ2d 1462, 1463 (Bd. Pat. App. & Inter. 1987). Here, the examiner has simply pointed out that said claimed feature is not disclosed in any part of the specification without presenting evidence or reasons why persons skilled in the art would not recognize in the present disclosure the description of the invention as defined by the claims. Accordingly, these rejections are legally inadequate and should be removed.

B. The Claims are Patentable Over Takashima

The present claims are patentable over Takashima. Although it does appear that Takashima discloses the merging of two or more ATM cells into a new ATM cell (e.g., at Fig 15 and the accompanying description), there does not appear to be any teaching or suggestion of including information indicative of a merging method so used in the header of the new ATM cell as presently claimed. Instead, Takashima apparently allocates header information to indicate the number of merged cells or the data boundaries of those cells. See, e.g., Takashima at col. 10, ll. 21-31. Neither of these approaches conveys information regarding the merging method used.

As indicated above, this feature of including information indicative of a merging method being used is fully supported by the present specification. The specification contemplates the use of any of a variety of merging methods and further describes ways in which the information regarding the merging method may be included in the filled cell. Therefore, because the claimed subject matter is supported by a specification that does describe the material in such a way as to reasonably convey to one of ordinary skill in the art that the inventors were in possession of the invention at the time the application was filed, and because the cited prior art fails to teach or suggest such claimed subject matter, the present claims are

patentable over that art.

C. Claims 21, 22 and 26 Are Directed to Statutory Subject Matter

The rejection of claims 21, 22 and 26 under 35 U.S.C. 101 is respectfully traversed. The rejection implies that an ATM cell cannot be patentable subject matter. Although the undersigned recognizes that the Patent Office has adopted a policy of denying patentability to data structures, *per se*, it is respectfully submitted that the claimed ATM cells do not fall within this category.

An ATM cell is a combination of information descriptions or representations organized to carry useful information between ATM devices (e.g., computer systems, switches, and the like). Rather than mere "functional descriptive material", an ATM cell is a specific arrangement of information elements, assembled by computer processes under associated program control (as may exist, for example, in a segmentation engine). These information elements are not simply abstract ideas, they are unique sequences of bits (usually represented as electrical or sometimes optical signals) that exist within and among computer systems, with each bit sequence specifically identifying and representing an address, control information or user data information. Thus, the contents of an ATM cell are real, tangible things, and thus the cell itself (i.e., the arrangement of these things in an ordered form) should qualify as patentable subject matter.

After considering the above argument the examiner advanced that the subject matter of claims 21, 22, and 26, an ATM cell, still is not statutory subject matter as it is only a data format showing the contents of payload and header. The Patent Office has adopted the definition of *data structure* as "a physical or logical relationship among data elements, designed to support specific data manipulation functions." See MPEP § 2106.IV.B.1. The courts have repeatedly expressed the broad interpretation intended by Congress in the language of 35 U.S.C § 101. See, e.g., Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980) (holding that Congress intended § 101 to extend to anything under the sun that is made by man); In re Alappat, 33 F.3d 1526, 1542 (Fed. Cir. 1994) (holding that the use of the term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may

be obtained). Hence, it is improper for the Office to broadly classify any physical relationship of data elements into a non-statutory subject matter category of *data structures*.

The claimed ATM cell is a unique sequence of bits, or physical relationship among data elements, designed to enable efficient use of available bandwidth in a communications network and hence improving the network's overall throughput. That is, the ATM cell claimed in the present invention, rather than being "nothing more than another way of describing the manipulation of ideas," is capable of causing functional change in the communications network, it improves the network's throughput, and therefore does not meet the *data structure* definition adopted by the Office. See In re Warmerdam, 33 F.3d 1354, 1362 (Fed. Cir. 1994). Consequently, an ATM cell as claimed in the present invention should be considered under a broad interpretation of § 101 to be patentable subject matter.

Moreover, other definitions of *data structures* describe them as more than mere arrangements of abstract ideas. For example, in programming, the term *data structure* refers to "a scheme for organizing related pieces of information." See, e.g., the Webopedia maintained by ZDNet, available at http://www.zdwebopedia.com/TERM/d/data_structure.html. "Schemes" are generally defined as carefully arranged and systematic programs of action for attaining some object or end; or orderly combinations of things on a definite plan or system. See, e.g., Webster's New World Dictionary, Second College Edition (1982). Thus, the plain meaning of the term data structure is a combination of related pieces of information. There can be no doubt that a "combination of things" is patentable subject matter under 35 U.S.C. 101, thus there does not appear to be any reason why a combination of related pieces of information should not be likewise patentable.

The Final Office Action cites nothing in support of the proposition that an ATM cell is not statutory subject matter and instead merely offers a "disagreement" with the above analysis. Such a conclusory statement is insufficient to deny patentability and this rejection should be removed.

IX. CONCLUSION

For the foregoing reasons, Appellants respectfully request reversal of the Examiner's rejections as set forth in the Final Office Action and request that the Board direct allowance of

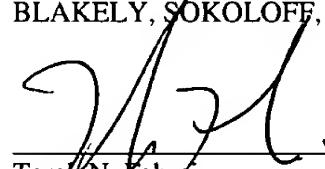
claims 1-3, 5-8, 14-16, 18-22 and 24-26. If there are any additional charges, please charge
Deposit Account No. 02-2666.

Respectfully submitted,

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APPENDIX A
(37 C.F.R. § 1.192 (c)(9))

The claims on appeal read as follows:

- 1 1. (Three times amended) A method for merging partially filled ATM cells, comprising the steps
2 of:
 - 3 removing a first partially filled ATM cell from an ATM cell stream;
 - 4 removing a second partially filled ATM cell from the ATM cell stream; and
 - 5 merging the first partially filled ATM cell and the second partially filled ATM cell into a
 - 6 third ATM cell having a header that includes information indicative of a merging method used.
- 1 2. A method for merging partially filled ATM cells as in claim 1, further comprising the step of:
2 inserting the third ATM cell into the ATM cell stream.
- 1 3. A method for merging partially filled ATM cells as in claim 2 wherein the header of said third
2 ATM cell further includes information required to reconstruct the partially filled ATM cells
3 contained within the third ATM cell.
- 1 5. A method for merging partially filled ATM cells as in claim 2 wherein the third ATM cell is
2 inserted into the ATM cell stream so as to maintain correct cell ordering within the ATM cell
3 stream.
- 1 6. A method for merging partially filled ATM cells as in claim 5 wherein said steps of removing a
2 first partially filled ATM cell from an ATM cell stream; removing a second partially filled ATM
3 cell from the ATM cell stream; and merging the first partially filled ATM cell and the second
4 partially filled ATM cell into a third ATM cell are carried out in an ATM switch.
- 1 7. A method for merging partially filled ATM cells as in claim 5 wherein said steps of removing a
2 first partially filled ATM cell from an ATM cell stream; removing a second partially filled ATM

3 cell from the ATM cell stream; and merging the first partially filled ATM cell and the second
4 partially filled ATM cell into a third ATM cell are carried out in an ATM end-system.

1 8. A method for merging partially filled ATM cells as in claim 5 further comprising the step of
2 transmitting the third ATM cell.

1 14. (Three times amended) An ATM network, comprising:

2 a first node configured to identify partially filled ATM cells within an ATM cell stream
3 passing through the first node and to merge two or more of the partially filled ATM cells in the
4 cell stream into a merged cell the merged cell having a header that includes information
5 indicative of a merging method used; and

6 a second node coupled to the first node and configured to identify a merged ATM cells
7 and to split the merged ATM cell into two or more partially filled ATM cells.

1 15. An ATM network as in claim 14 wherein the first node is configured such that circuitry in the
2 first node performs the steps of:

3 removing a first partially filled ATM cell from the ATM cell stream;
4 removing a second partially filled ATM cell from the ATM cell stream; and
5 merging the first partially filled ATM cell and the second partially filled ATM cell into a
6 third ATM cell.

1 16. An ATM network as in claim 15 wherein the first node is further configured such that
2 circuitry in the first node performs the further step of:
3 inserting the third ATM cell into the ATM cell stream.

1 18. An ATM network as in claim 16 wherein the third ATM cell is inserted into the ATM cell
2 stream so as to maintain correct cell ordering within the ATM cell stream.

1 19. An ATM network as in claim 16 wherein the first node is an ATM end-system.

1 20. An ATM network as in claim 16 wherein the first node is an ATM switch.

1 21. (Three times amended) An ATM cell, comprising:

2 a payload including information from two or more partially filled ATM cells; and

3 a header including information indicative of a merging method used to construct the

4 ATM cell.

1 22. The ATM cell of claim 21 wherein the information indicative of the number of partially filled

2 ATM cells comprises a VCI.

3 24. The method of claim 1 wherein the header of the third ATM cell further includes information

4 indicative of the number of partially filled ATM cells contained within the third ATM cell.

1 25. The ATM network of claim 14 wherein the header of the merged cell further includes

2 information indicative of the number of partially filled ATM cells contained within the third

3 ATM cell

1 26. The ATM cell of claim 21 wherein the header of the ATM cell further includes information

2 indicative of the number of partially filled ATM cells that contributed to the information within

3 the payload.